

# LIVUWU FOLLOW-UP SURVEY REPORT

For:

Household Water Treatment and Safe Storage (HWTS)  
Pilot Project in Nkhata Bay North



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Nkhata Bay, Malawi

Prepared by:



**CCAP**  
SMART Centre  
Malawi  
Member of the SMART Centre Group

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[www.smartcentremalawi.com](http://www.smartcentremalawi.com)

[info@smartcentremalawi.com](mailto:info@smartcentremalawi.com)

## **2. Introduction to project**

### *a) Background, purpose and objective*

“Pure water is the World’s first and foremost medicine.” – Proverb

An estimated 2.5 billion people lack access to sanitation, 4 billion people will contract a diarrheal disease annually, and 1.8 million people will die every year from drinking contaminated water (USAID, 2007; Schmidt, 2014). The International Declaration for Human Rights sites clean water as a basic right which all people need and deserve – yet many do not have access to it. Looking particularly at Malawi, a 2012 survey showed that 18 % of children under 5 have had a diarrheal case in the last two weeks, and 74 % of those cases required oral rehydration solution (ORS) for their recovery (Schlanger, 2012). Still further, even with a clean water source – there are many points of contact (collection, transport, and storage) which can contaminate water before it is consumed. Thus, this project looks at the feasibility and impact of household based water treatment and safe storage (HWTS) within Northern Malawi as an option for providing this basic of human right to rural populations. The overall objective of the project is to support and study the potential for culture/behavior change around community health in northern Malawi.

The project team evaluated several HWTS options as part of the preparation of the project. After comparing chlorine, sodic, ceramic pot filters, biosand filters and ceramic candle filters a choice was made to use ceramic candle filters in this pilot. The choice was based on the availability, its local production, its high efficiency compared to other options and the low costs.

As part of the distribution the ‘Try and Buy’ model was adopted where clients are offered a chance to try the filter for 2 months before making a decision to buy the filter. After the decision to buy the client has to pay the cost of the filter in 5 instalments of 1.000 MK/month (\$1.30/month)

### *b) Target population*

Project implementation occurred in Livuwu Village, in Nkhata Bay North (TA Mbwana), with an estimated 200 to 250 households (HH) - impacting approximately 1500 adults and children (average HH size is 7). Livuwu is located 84 km north-east of Mzuzu and about 300 km north of the capital Lilongwe. It is situated in a very remote area which is only accessible by boat or walking (the closest paved road is about 65 km northwest along a dirt/rough road). Furthermore Livuwu has limited access to electricity or

piped water. Livuwu's only water sources are Lake Malawi and a shallow well accessible to a few HH in the upland of the village. The isolation of Livuwu, while being the cause for many of its hardships, also allows it to be an ideal study site for health interventions. The people of Livuwu only leave to sell fish in the upland villages and has a low migratory population.

The main sources of water used in Livuwu are Lake Malawi, a stream coming from the hills and a communal tap from the gravity scheme. The water from the gravity is treated with chlorine, but not constantly due to lack of chlorine. Especially during the rainy season the water from the tap becomes very turbid and most community members opt for using the lake water.. Secondly, for most households, the lake is the source of water closest to their homes.



*Figure 1: Tap water in Livuwu*

### c) *Set-up of distribution*

The project has used the following steps in engaging the community of Livuwu and distributing the filters.

1. District briefing meeting *(Dec 2016)*
2. Village Development Committee (VDC) / Area Development Committee (ADC) meeting *(Dec 2016)*
3. Training of the Trainers (TOT) and Surveyors *(Dec 2016)*
4. Baseline and Quality of Life (QoL) data collection *(Jan 2017)*
5. Community Education Session on HWTS and Water Filter Use, including distribution of vouchers and special sessions for children. *(Jan 2017)*
6. HH Water filters distribution (for each household attending the HWTS training. At minimum 1 adult per HH is required). *(Jan 2017)*
  - 1) Water filters will be given for free to each household following a try and buy system. After one month families will then set up a payment plan to pay for 50% of the cost of the filters (5,000 MK).
  - 2) Replacements parts will be made available at local shops for the price of MK 3000- and each HH will buy as needed. If a family cannot afford the replacements then the community health committee will access the HH vulnerability and will report to Temwa and CCAP SMART Centre for a subsidized replacement parts.
7. Monitoring and Evaluation *(ongoing)*
8. Community awareness campaigns *(ongoing)*



*Figure 2: SMART Centre staff teaching about Sanitation during the community education sessions. Would you drink from a coke after it's been touched by a fly?*

*d) Monitoring and follow-up*

In the project design, the majority of the monitoring and follow-up was to take place by the local set-up was for the local Temwa field officer. He would meet with the committee on at least a monthly basis to hand over collections of filter payments and to discuss issues that might come up.

Secondly, as part of the ongoing monitoring and follow-up a number of visits have been made:

1. Follow-up visit to train the committee on handling of finances and to check on the correct installation and use of the filters and to tackle (Feb 2017)
2. Follow-up visit on payments made (May 2017)
3. Half year follow-up survey by VirginiaTech team (Aug 2017)
4. Meeting with local stakeholders to discuss way forward (Sept 2017).



*Figure 3: Temwa staff collecting QOL surveys*



### ***3. Introduction to survey***

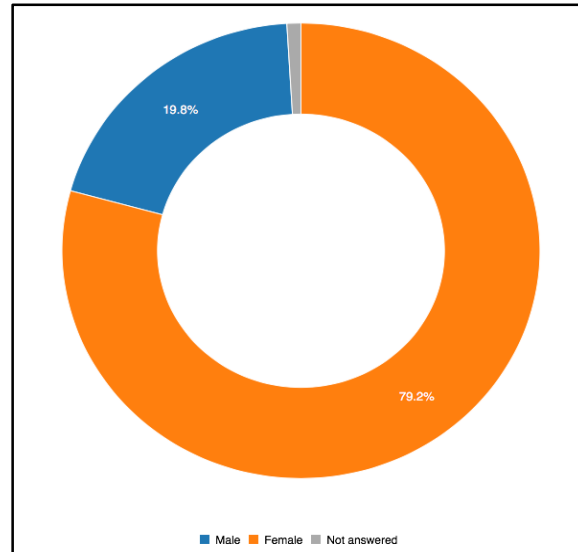
The team conducted a follow-up survey in both the Livuwu and Thandati communities where a baseline survey was carried out in February 2017 to determine the impacts of the household water filter pilot project. The survey team comprised of two Virginia Tech students, two recent Mzuzu University graduates and one CCAP SMART Centre team member. 106 households were surveyed using the mWater App over a period of 2 days on the 3rd and 4th of August 2017. Only households with SAFI filters were included in the follow-up survey. The questions are aimed at understanding current filter usage, filter functionality, committee perceptions, finances and health impacts. Some questions that were previously used in the baseline survey were also included in the follow-up survey in order to be able to make some comparisons.



#### 4. Results and Discussion

The following section contains an overview of the results found during the survey as well as a discussion on the outcomes.

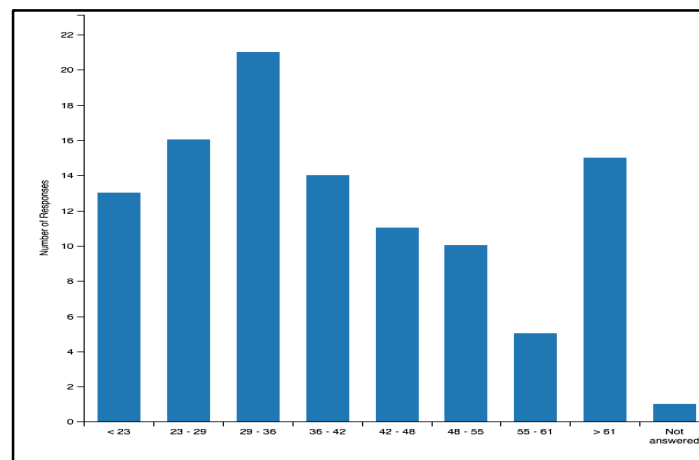
##### a) Respondent Background



**Gender of Respondents**

A majority of the respondents were women (79.2% female and 19.8% male)

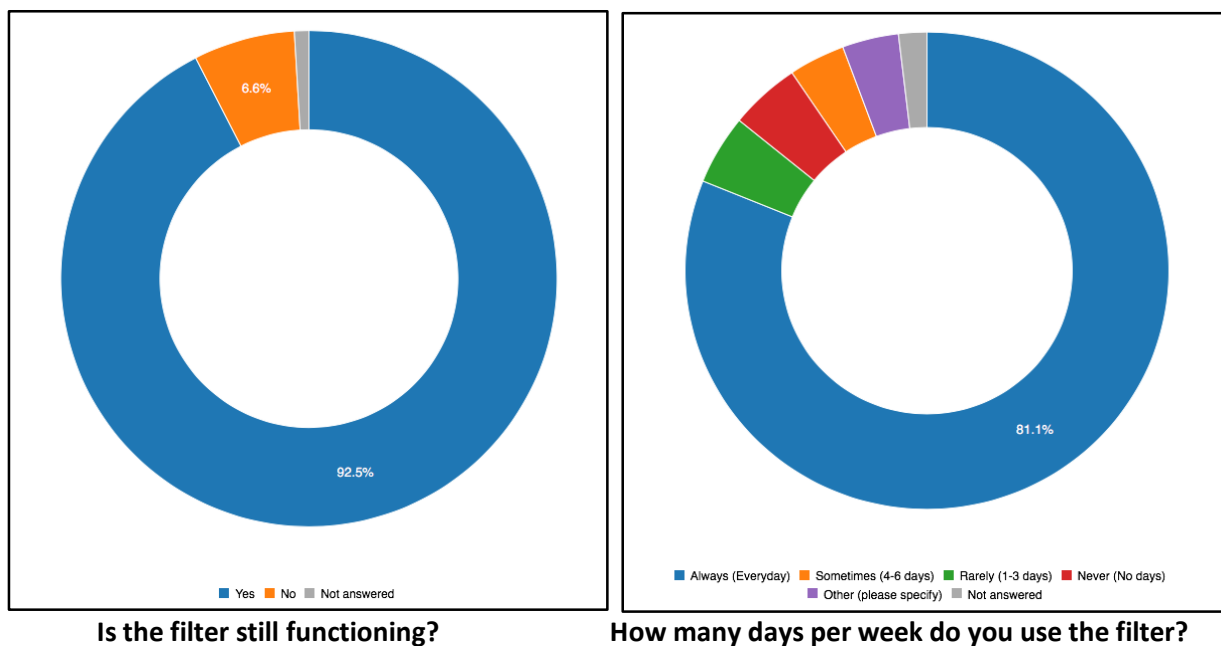
##### Respondent Age Range



Similar to the baseline survey, the majority of respondents were between 20 and 40 years, however, there was also a large number of respondents who were older than 61 years as the head of the household.



*b) Filter Usage and Functionality*

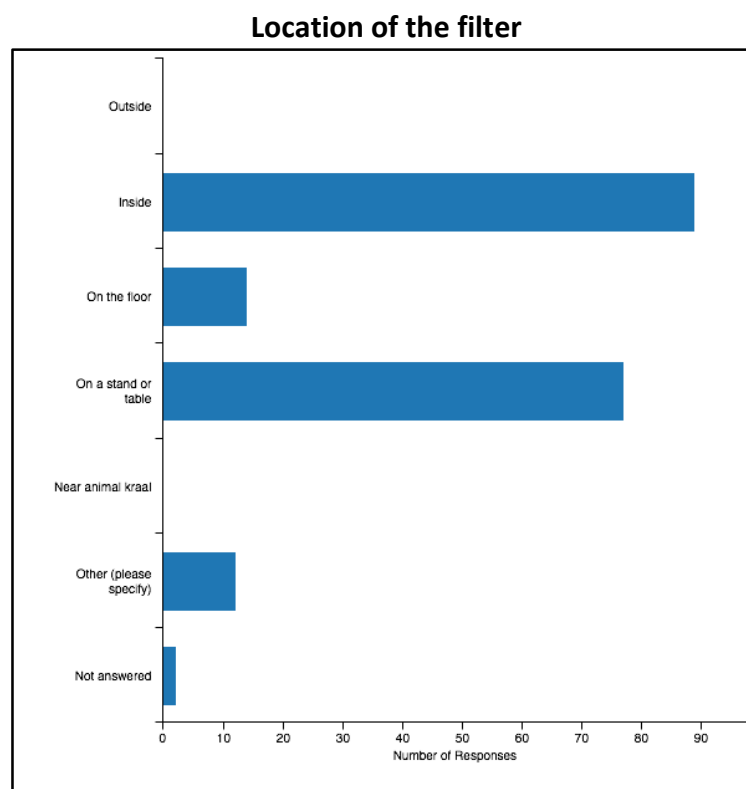


In terms of filter usage and functionality, 92.5% of distributed filters are still functioning and being used at the time of this survey. 6.6% of participants reported that filters were not in use since some households kept the filters to be used only during the rainy season when the water was perceived to be unsafe to drink due to high turbidity. The survey also noted that some filters were not functional because they had broken down and not yet been repaired.

The high functionality is a particularly encouraging development as it is a strong indication of household ownership and long term sustainability of the filters. Furthermore, the high functionality and usage rates can likely be attributed to having households pay for the filters. By paying their own money as opposed to having the filters donated to them in full, households could have been incentivized to value the filters more and keep them intact. The high functionality and usage rates as well as the level of knowledge on filter usage also indicate that clients were fully oriented and understood the relevance and implication of the filters in terms of their own health.

The survey found out that 81.1% of sampled households used the filter all 7 days of the week and the majority of respondents stated that using the filter 7 days a week is 'the best way to prevent diseases' and 'that is what they were particularly taught to do' during the filter

training. This is an encouraging development which correlates strongly with filter functionality discussed in preceding paragraphs.

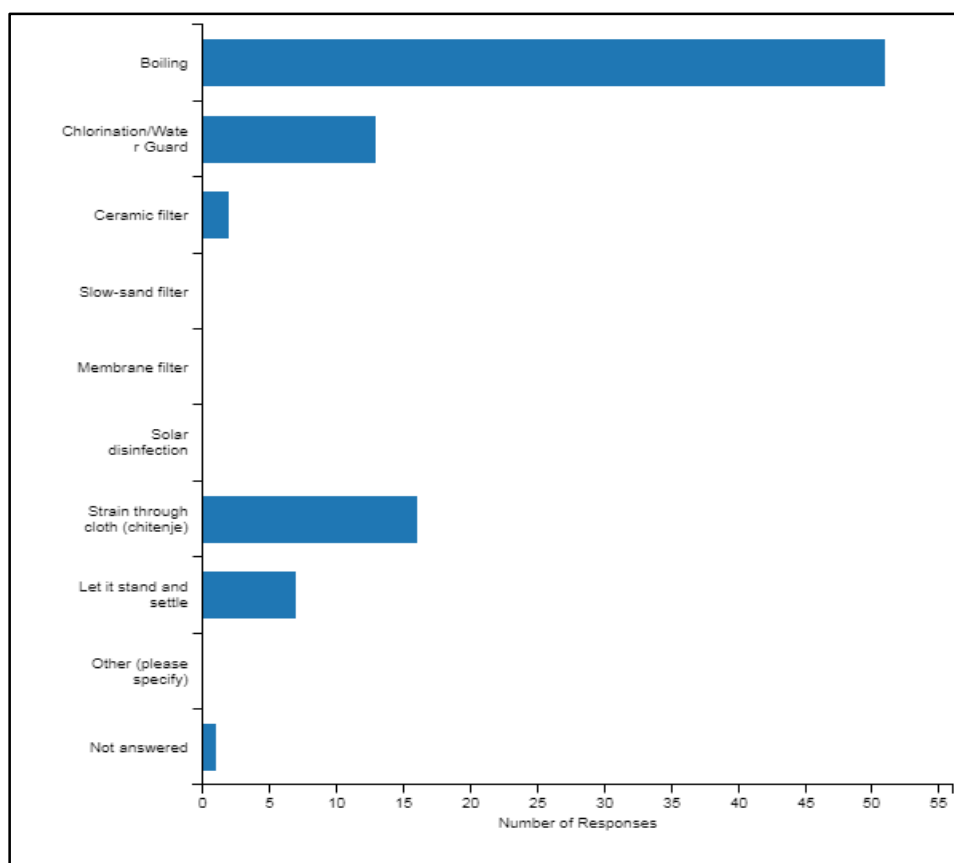


During the follow-up survey, it was found that all of the filters were located inside the house but not necessarily out of reach from animals. Unlike the baseline survey, the follow-up survey did not have a definition for what was out of reach from animals. While the filters were inside, animals like chickens, dogs or cats could easily walk inside the homes since many filters were seen either on the ground or close to the ground. In general, most households put filters on either a table/stand (72.6%), and the 13.2% of households who kept their filter on the floor often moved the filter onto another bucket or stand whenever they wanted to use it. It is also important to note that many of the households did not let children use the filter in order to prevent it from being broken or damaged. For this specific question, more than one option was available for the location of the filter, where many respondents had their filters located simultaneously inside their home and on a stand/table.



Figure 4: A typical position of the filter found in the Usisya homes.

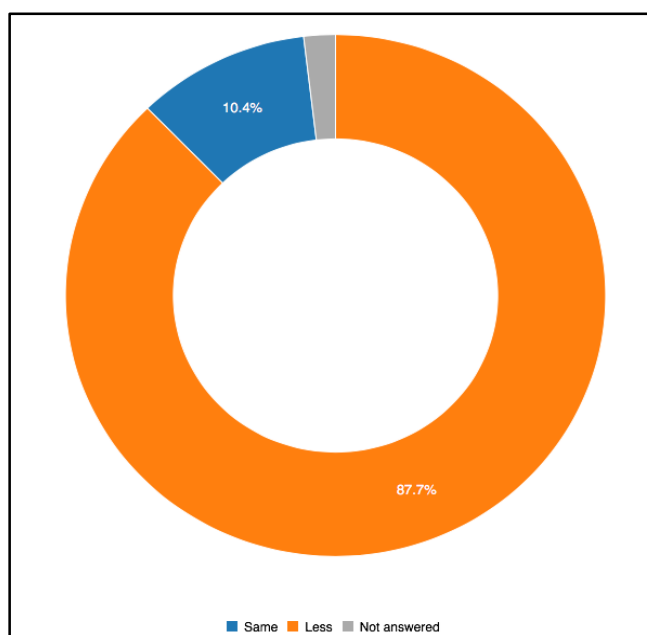
### c) Health Impacts



**How did you treat water before you started using the filter?**

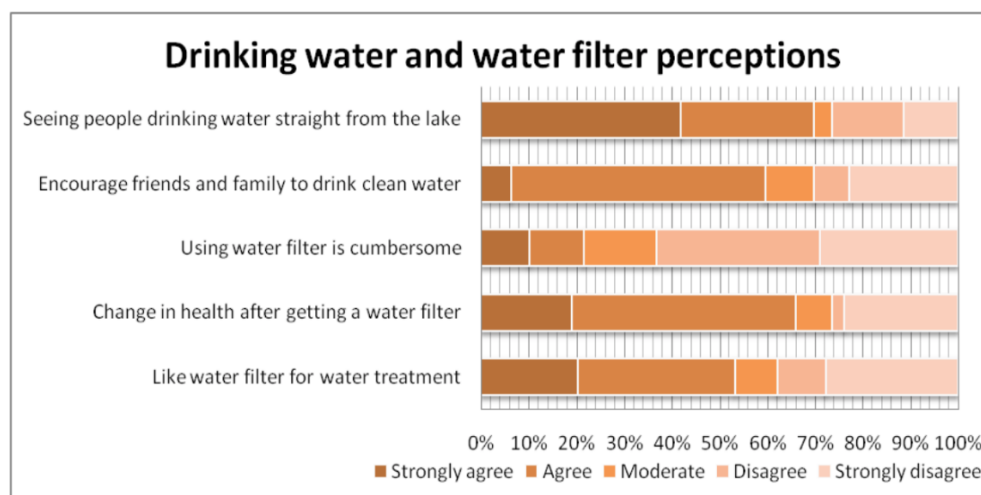
The survey shows that before the distribution of the filters, most households treated their water using recommended methods including boiling and chlorination. In the survey, 51 respondents reported using boiling methods before they started using their current filters. These results agree with the baseline survey report which indicated that most households in the community were trained by government entities such as district officials, Health and Surveillance Assistants (HSAs) on how to use these methods.

**How does the frequency of diarrhea compare to before you had the filter?**

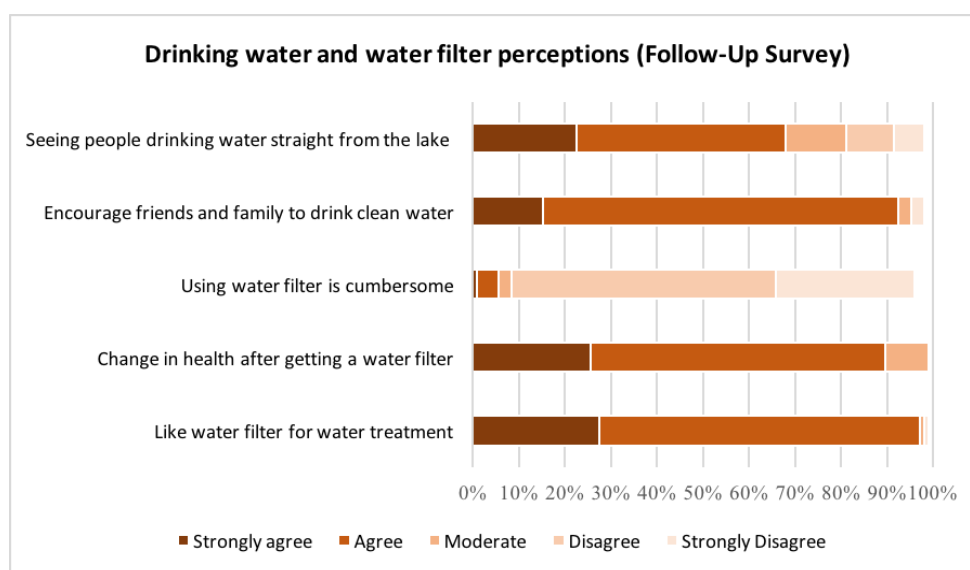


For this question 87.7% of respondents stated that they currently have less diarrhea than before they started using the filter. This is also an indication that the project is being sustained and owned by the community and is achieving its broader goal of improving community health through provision of safe water services. The 87.7% of respondents, including children and adults who reported less diarrhea, shows evidence that the filters were being used regularly and appropriately. This figure was similar for both children and adults.

d) *Water Filter Perceptions*

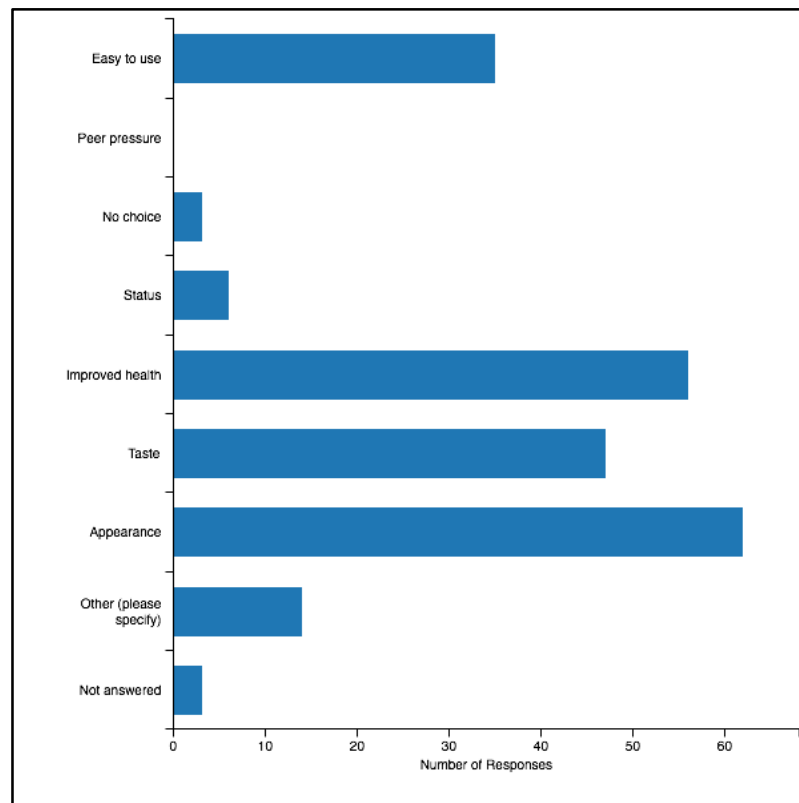


The chart shown above was created from the results of the baseline survey.



The same questions about drinking water and filter perceptions from the baseline survey in the behavior change section were also asked in the follow-up survey. Based on both of the charts above, the perceptions of the SAFI water filters have improved. Nearly 30% of people now strongly agree that they like using the water filter for treatment and about 25% strongly agree that they see a change in the health of their family from using the water filter. Both of these indicators have seen an increase compared to the baseline survey.

### Why did you decide to purchase the filter after trying it?

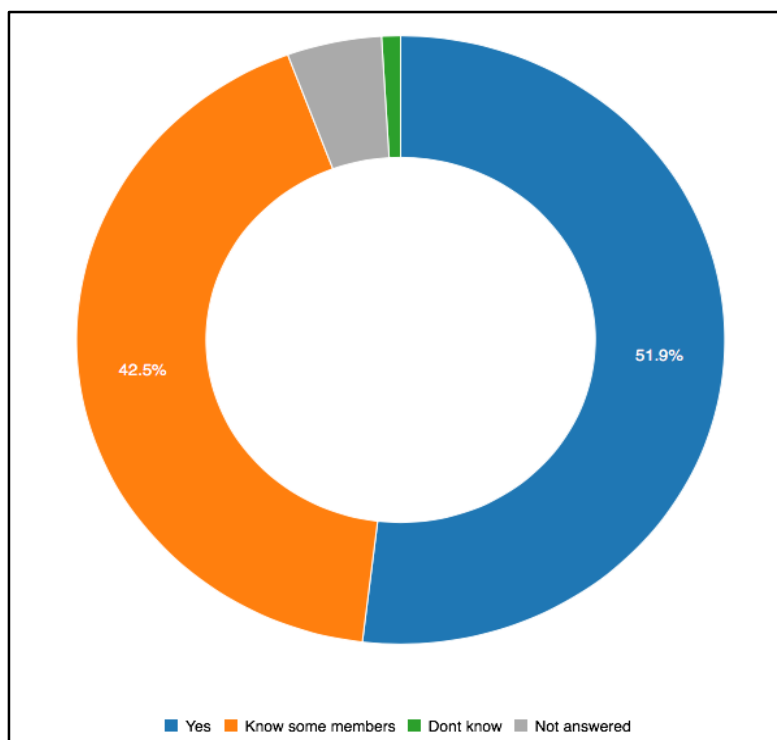


Based on the survey, 62 people (58.5%) chose appearance of the water as one of the reasons for purchasing the filter after trying it. 56 people (52.8%) also chose improved health as one of the reasons for buying the filter, while the third and fourth most popular responses were taste with 47 people (44.3%) and ease of use with 35 people (33.0%). On the other hand, only 6 respondents (5.6%) chose status as one of the reasons they purchased the filter. These figures show that most respondents care at least as much, if not more, about what the appearance of the water coming out of the filter compared to the health benefits that they received from using the filter. This trend can be attributed to people relating the appearance of their water to safety and health. People also find the filter easy to use, which is noted in one of the behavior change questions as well. Overall, it is clear from these figures that community members care more about the physical appearance of the water and the health benefits that they gain from using the filter rather than social benefits such as improved status.



*e) Committee Knowledge and Trust*

**Do you know who the members of the committee are?**

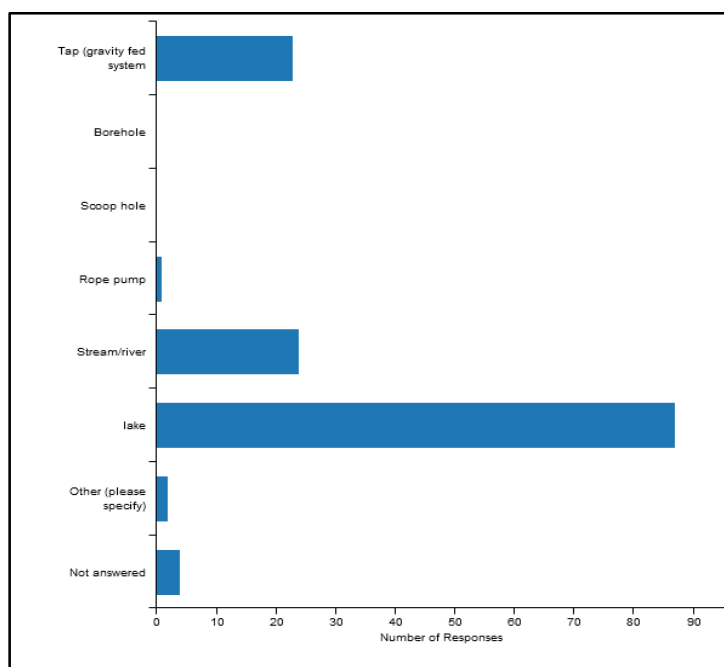


In addition to perceptions about the water filter, the follow-up survey also noted perceptions that the community had about the committee itself. While 90% of people reported they trust the filter committee, the community members also admitted that the committee did not visit them as often as they used to, which had a negative impact on the availability of spare parts and flow of payments.

Based on the survey, 51.9% of respondents knew all of the members of the water filter committee while 42.5% knew some of the members. When asked what the water committee does, 83% of respondents stated that the committee's job is to 'collect money'. Other responses mentioned responsibilities of monitoring usage and functionality of the filters, as well as spreading awareness about clean water.

f) *Water Sources*

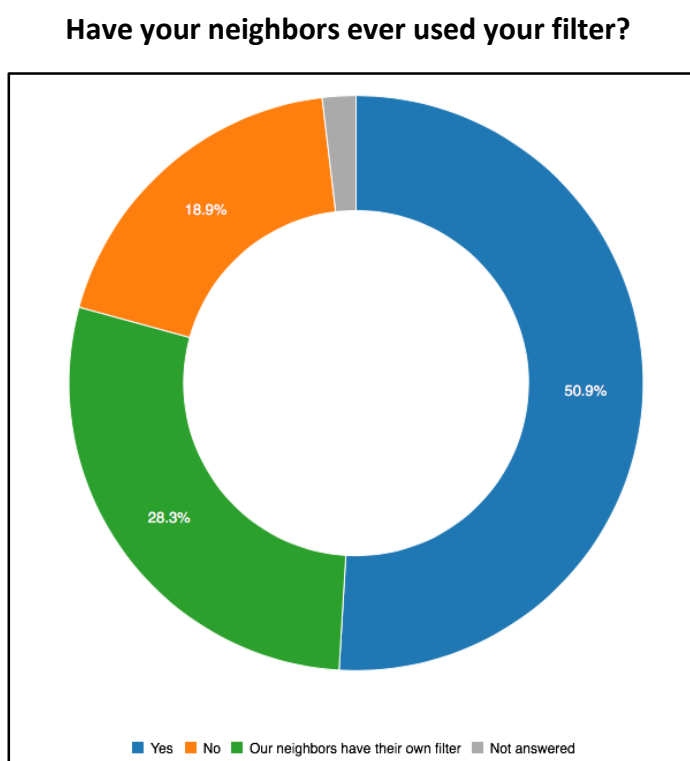
**What source of water do you use to fill your filter?**



In the follow-up survey, most people disagreed that they saw others in their community drinking straight from the lake and 92.5% of people either encouraged or strongly encouraged their family and friends to drink clean water. However, it was obvious that people who did not currently have filters and lived in Thandati were much more likely to drink straight from the lake without any treatment since the lake is the only source of water for all domestic purposes in the area unlike Livuwu where most respondents had about three possible sources of water including the lake, river and standpipes from the gravity fed system. It should be noted that some households indicated multiple sources for their drinking water instead of just one. Certain households used all three and/or two sources in Livuwu depending on the season, proximity, and accessibility of the nearest source. These results differ significantly from the baseline survey which reported 43% of respondents were using tap water from the gravity scheme for drinking while 47% used water from streams. A meager 9% was reportedly using the lake for drinking water. In the follow-up survey it was found that 21.7% reported using tap water from the gravity scheme, 22.6% used streams. This time, 82.1% of respondents used the lake as a source of water. These major discrepancies are probably due to differences in sample size (106

during the follow-up survey against 63 during the baseline survey) and sample selection. Even though both surveys were taken in Usisya, the baseline survey incorporated the general public, including those that did not necessarily receive filters, while the follow-up survey only targeted households that had filters. Also, the gravity systems tend to be more turbid and take a longer time to filter. Another reason that more people from the follow-up survey might use the lake to fill their filter is that their homes are located closer to the lake compared to the gravity fed sources.

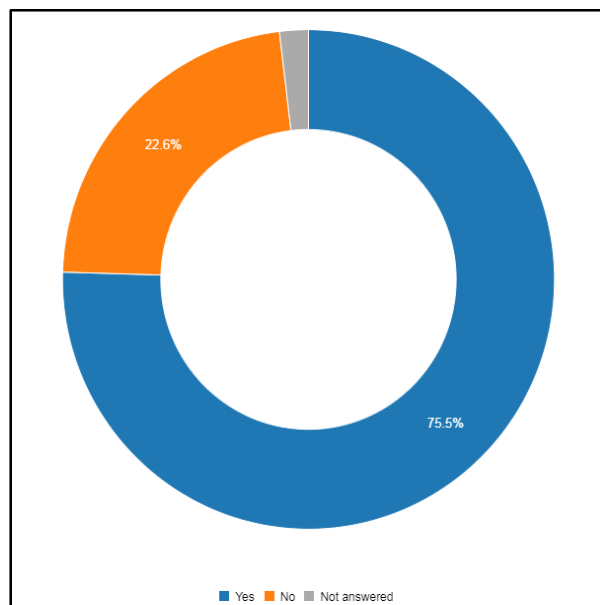
*g) Sharing filters with neighbours*



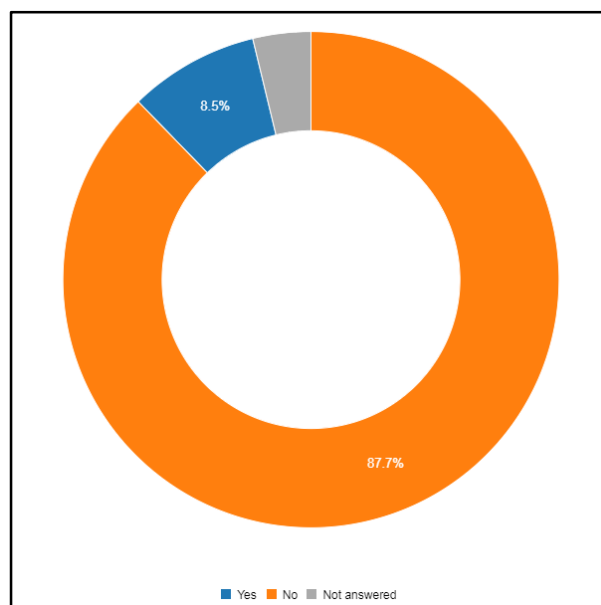
50.9% of community members reported that their neighbor had used their filter while 28.3% of respondents said their neighbors had their own filter. These results also provide evidence that the community has a positive perception of the filters, even among community members who do not have their own filters. The more people that used their neighbors' filters, the more opportunities the respondents had to recommend it to them.

#### *h) Replacement and availability of spare parts*

**Do you know where to purchase spare parts?**

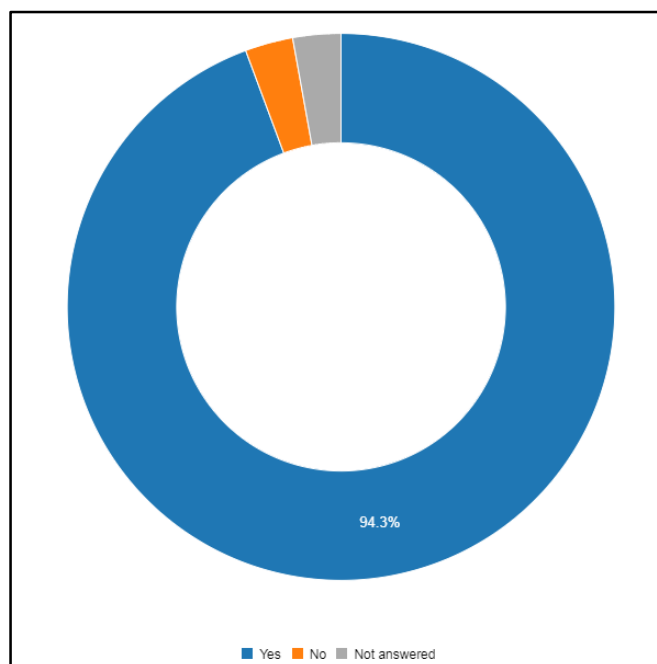


**Have you ever replaced any parts of the filter?**



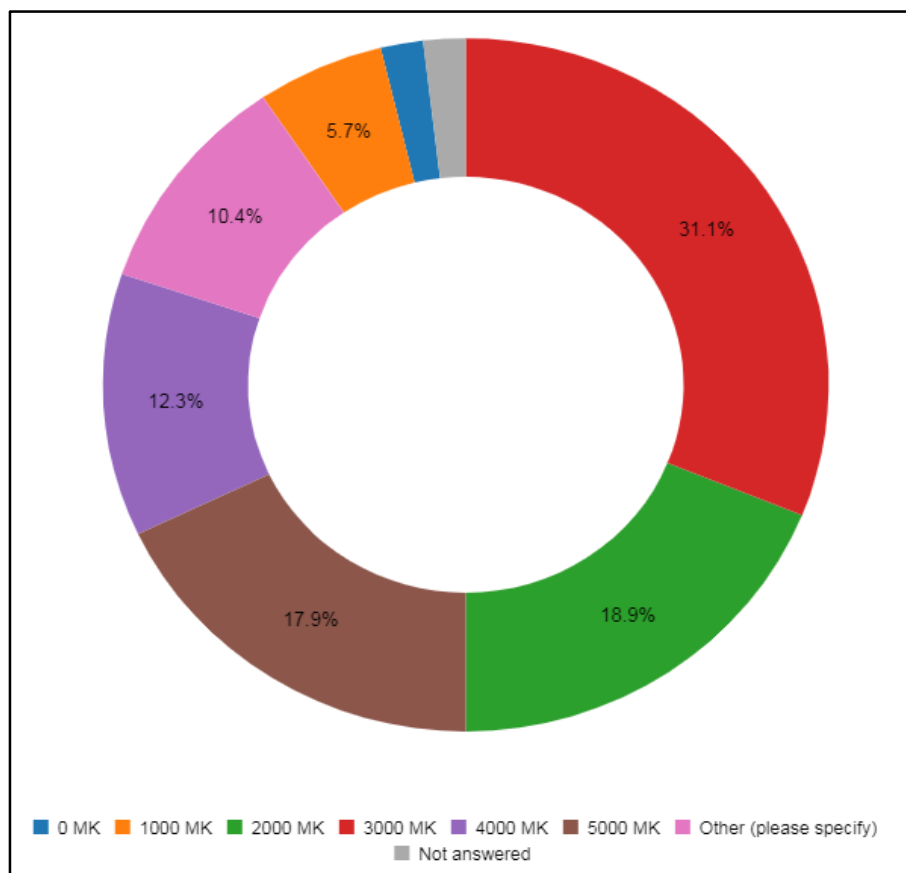
The study shows 75.5% of the respondents reported that they know where to purchase spare parts and 8.5% of respondents have replaced a part of their filter. Most people reported that the filter tap was the most common part to break down. 80% of the respondents who had knowledge of where to purchase spare parts said that they can ask Temwa and 25% mentioned the water filter committee as someone they can ask about replacement parts.

i) *Willingness to buy another filter or spare parts*



**Would you be willing to buy a new filter or spare parts if your current filter broke down?**

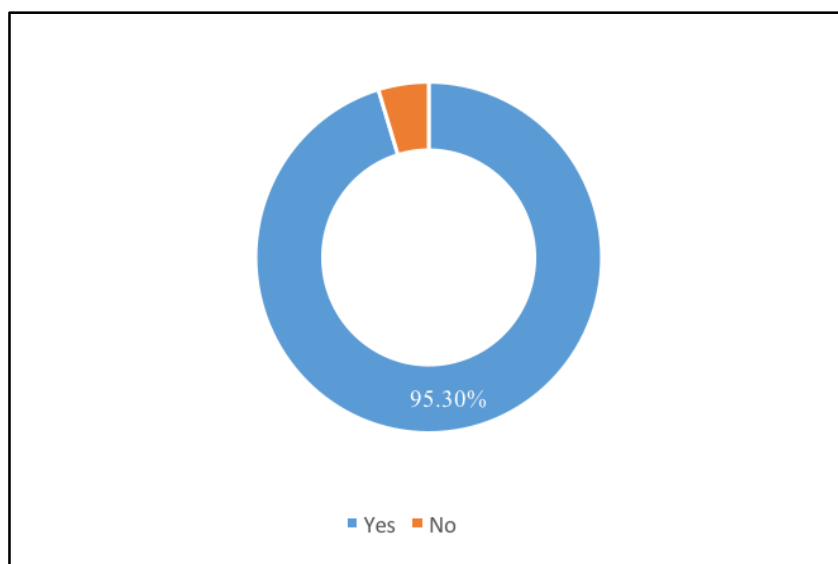
Most households (94.3%) reported that they were willing to buy another filter and/or spare parts in the event that their current filter broke down because they understood the importance of the filters in preventing many water-related diseases. This is an indication that most households continuously get clean water from their filters and have noted enough improved health impacts to continue using the filters in the long term.

*j) Finances***How much have you paid for the filter so far?**

The survey revealed that 31.1% of total households managed to pay the sum MK 3,000 per month since they started using the filters followed by 18.9% of households who had paid MK 2,000. Some households had already paid the full MK 5,000, representing 17.9% of respondents. A smaller proportion of total households at 12.3 % contributed MK 4,000, while 5.7% of households managed to pay MK 1,000.

A larger proportion (69.8%) of households use fishing as a main source of getting money to buy the filters. According to this chart, people are generally committed to paying for their filters.



*k) Training***Does the respondent know how to properly clean the filter?**

When asked to demonstrate how to clean the filter, 95.3% of respondents showed how to properly clean the filter (with the toothbrush and no soap). At the time of the survey, 61% of respondents were the member the household who was trained. Subsequently, this means that the information learned in the survey about filter operations and cleaning is being transferred to other members of the family. Also, 100% of the SAFI systems that were in use were producing clean water that was free of debris or other substances. This further indicates the proper functionality of the filters and correct knowledge of cleaning techniques by the community members.